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THE USE OF IRON IN CERTAIN STAGES OF CARDIAC DISEASE, AND THE ADVANTAGE OF COMBINING CHLORIDE OF AMMONIUM WITH IRON.

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In this communication I wish to draw attention to two points. First, that in certain cardiac cases, particularly those in which the aortic valves are diseased, a peculiar condition sometimes arises which demands for its treatment large doses of iron. Second, that in some cases, both belonging to the above group and of other kinds, the reception of iron by the system is greatly facilitated if chloride of ammonium be administered along with it.

In illustration of both points I shall cite the following case :—

Neil McLeod, a seaman, 33 years of age, was admitted to the Royal Infirmary on the 23rd October, 1877, complaining of breathlessness on exertion, giddiness, palpitation and pain in the region of the heart. In 1867 he had suffered from rheumatic

fever, but was not aware that any cardiac complication had then existed. In 1875 he observed that his strength was failing, that he had become breathless on exertion, was apt to cough, and often had passing fits of giddiness. These symptoms rapidly increased, and he soon felt himself unfit for duty.

At different times he was under treatment in the infirmary at Calcutta, and in Greenwich Hospital, and although he made each time a temporary rally, he soon fell back, and on the whole the debility, breathlessness, and pain, were gradually increasing.

The exacerbation of illness which led him to seek admission to the infirmary, had been induced partly by hard work while employed in a coasting vessel scarcely sea-worthy, and partly by intemperance.

On admission his face was pale, his expression anxious, his eyes were somewhat staring, his lips slightly livid. His temperature was normal, and beyond flabbiness of tongue, and some feebleness of digestion, there was no disease of the alimentary system. The liver dulness was increased, measuring seven inches in the mammillary line, and the organ was tender on pressure. There was some bulging in the præcordial region. The apex beat of the heart was felt strong and diffused, the area of dulness of the heart was increased. On auscultation in the mitral area, a loud, harsh, systolic bruit was heard propagated towards the axilla and inferior angle of the scapula. There was also a slight diastolic murmur. In the tricuspid area there was a short systolic murmur and a prolonged diastolic murmur. In the aortic area the first sound was weak and impure, there was also a loud high-pitched diastolic murmur propagated down the sternum to the ensiform cartilage. In the pulmonary area the second sound was accentuated. The pulse was forty six per minute, weak and compressible, and even in this condition presented something of the water-hammer character, although much less distinctly than it did at a later period in the history of the case. There was no dropsy, and the urine was natural.

There could be little doubt that the valvular lesions had originated in connection with the rheumatic fever, and it was clear that these lesions were incompetence of the aortic and mitral valves, with impairment of the muscular power of the

heart. All the other symptoms, the general poverty of blood, the cerebral anæmia, giddiness and general distress, were secondary to these. The indications for treatment were to obtain rest, to support the strength, and in particular to strengthen the heart and improve the condition of the blood. If these indications could be met, it seemed likely that the symptoms due to anæmia and deficient nutrition of the brain would disappear, and that on their disappearance the patient would be comparatively well. With the view of meeting the first indication, the patient was directed to remain in bed; the second, food rich in nitrogen, and in quantities small at a time but frequently repeated; and the third, perchloride of iron in full doses was prescribed. At first twenty minims of the tincture were given three times a day, but the doses were gradually given more frequently until he was taking five or six in the twenty-four hours. It was at once apparent that these measures were doing good. The pallor became less marked, the giddiness and headache less troublesome. But some functional derangement of the stomach and liver set in, the tongue became furred, the appetite impaired, the liver somewhat more enlarged from increased congestion, and the headache became again more severe; the patient's condition thus continued to be manifestly perilous. Under these circumstances, instead of abandoning perchloride of iron, I added to it chloride of ammonium in doses of half a grain to each minim of the tincture. This was followed by the best results, for the gastric and hepatic symptoms gradually disappeared, and after a considerable time the patient went on taking the mixture six times a day, so that he used two drams of the tincture of perchloride of iron daily, without exhibiting the slightest sign of gastric or hepatic disturbance.

As a result of this treatment, to quote the words of Mr. Henry Handford, M.B., the clinical clerk, "a gradual but marked improvement in his general condition took place. His face lost its anxious expression, the palpitations became less distressing, the action of the heart less tumultuous, although still not quite regular. The pulse became much stronger and more frequent—seventy in the minute—and more characteristic of aortic regurgitation. The aortic diastolic murmur became less loud, but

nevertheless was quite distinct. The mitral symptoms remained unaltered. The congestion of the liver was not so great, as shown by a decrease in the vertical dulness. The transverse dulness of the heart was unaltered." It may be added that the pallor and the signs of cerebral anæmia became less marked, and the patient left the infirmary in a condition which enabled him to resume his occupation.

This case afforded an example of a condition by no means uncommon, but of which I have been unable to find a satisfactory description in books. The first glance at the patient leads one to notice the pallor, the very anxious expression, the restlessness, the pale lividity of the lips, the throbbing of the carotids, and perhaps of the temporal arteries; whilst the patient complains of giddiness, perhaps of headache, certainly of breathlessness, and of a debility that amounts at times to faintness. He is somewhat relieved by food, and unless there is some dropsical effusion to prevent it, he is easier in the recumbent position. But he obtains very little sleep. The explanation of his various symptoms is readily found. The pallor and the head symptoms are due in part to anæmic deterioration of the blood and partly to imperfect filling of the arteries supplying the face and brain. The throbbing is due to the ill-filled condition of the arteries, contrasting with their sudden temporary filling during the ventricular systole; while the breathlessness and the lividity are connected with the dilatation and the partial failure of the heart's action. Sometimes the distress is aggravated by the existence of dropsical effusion, and it seems to be specially severe when the pericardium is its seat. Such cases sometimes prove rapidly fatal by sudden syncope, and sometimes death follows upon a long agony, characterised mainly by symptoms of cerebral anæmia. These cases do not seem ever to recover spontaneously.

Treatment by the administration of cardiac tonics, and especially of iron, leads in many cases to decided improvement. The form which I find best is the tincture of perchloride, but it must be given in large quantity. I have gradually been led to give it in larger doses; sometimes even to the amount of twenty minims every two hours, more frequently every four hours, continuing its use for days together. In many cases

the patients speedily experience relief, and before long there is manifest improvement. As in the patient whose history I have given, they are enabled after a time to leave the hospital and return to work.

But there is great difficulty in carrying out this plan of treatment from the gastric and hepatic derangement which so frequently follows upon the use of iron. During the past two years I have sought to meet this difficulty by combining chloride of ammonium with the iron, according to the suggestion of a medical officer of the Indian service, to the members of which we are so much indebted for our knowledge of the value of that salt in hepatic affections. During that time I have repeatedly been thus enabled to administer iron in large doses in combination with chloride, to patients who otherwise could scarcely have used iron. It will be observed that in the case now recorded, the iron speedily led to dyspeptic symptoms, so that it was impossible to persevere with its use. But the addition of the chloride both relieved the existing dyspepsia and enabled us to continue to administer the iron in large doses, and for a considerable time. So far as I can judge, iron is the only remedy which could have saved the life of the patient at the time, and but for this effect of the chloride of ammonium, I do not know how I could have administered iron so freely as to suffice.

But the combination of perchloride of iron and chloride of ammonium is useful not in cardiac cases only. I shall not narrate cases of my own in illustration of this, but shall bring forward two, of which notes have been given me by my friend, Dr. James Ritchie.

A lady, aged 62, suffering from carcinoma uteri, had frequent attacks of metrorrhagia which had produced profound anæmia. The tincture of perchloride of iron was prescribed, but it produced so much gastric irritation that it had to be discontinued. After the stomach had recovered she was again ordered tincture of perchloride, with the addition of ten grains of the chloride of ammonium, to every twenty minims of the tincture. This mixture was well received by the stomach, and was continued for some weeks without the slightest disturbance of digestion.

Again, a boy of 13, of feeble and rather strumous constitution, suffered from sore throat, gastro-intestinal disturbance, headache, giddiness, and almost daily epistaxis. The liver was enlarged so as to extend down nearly to the umbilicus, was tender, and had an uneven surface. The spleen also was enlarged, and projected three inches beyond the costal cartilages. Microscopic examination of the blood showed marked increase of the white corpuscles, with great diminution of the red, and an unusual amount of granular material. In this case it seemed highly probable that the iron alone could not be received, and accordingly the combination of iron and chloride was administered. The medicines were well borne, and speedy improvement of the general condition took place.

